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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,800

09/28/2006

Kenji Furukawa

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THE WEBB LAW FIRM, P.C.
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH, PA 15219

EXAMINER

WARE, DEBORAH K

ART UNIT

PAPER NUMBER

1651

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,800	Applicant(s) FURUKAWA ET AL.	
	Examiner DEBBIE K. WARE	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3 and 16-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3 and 16-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/28/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/12/10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 3 and 16-27 are pending.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Response to Amendment

The amendment filed May 11, 2010, has been received and entered. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

Applicant's election without traverse of claim 3, and newly added claims 16-27 in the reply filed on December 9, 2009, is acknowledged.

Claims 1-2 and 4-15 have been canceled.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on April 12, 2010, was filed after the mailing date of the Office Action on March 3, 2010. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3 and 16-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tal et al (USP 7314741), cited on enclosed PTO-892 Form, in view of Rouse et al and Hiroyuki Tokitoh, both cited on previously enclosed PTO-1449 Form, and newly cited Hatozaki, Ritsuko et al, cited on enclosed PTO-1449 Form.

Claims are drawn to a process for treating ammonia containing waste water comprising contacting wastewater containing ammonia with a treating material wherein the material comprises a nonwoven carrier and attached to a support. Bacterial sludge comprising anammox bacteria. The wastewater can contain dissolved oxygen at a

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concentration of not less than 0.5 mg/L. The bacterial sludge has a core-sheath structure.

Tal et al teach at col. 6, lines 15-25, a complex bacterial sludge comprising bacteria including autotrophic anamox bacteria and bacteria including autotrophic ammonia-oxidizing bacteria being used for a process for treating ammonia containing wastewater to remove ammonia as nitrogen gas. A carrier and support are disclosed. The water contains oxygen.

The claims differ from Tal et al in that a nonwoven carrier, dissolved oxygen concentration of not less than 0.5 mg/l and acrylic fibers are not disclosed.

Rouse et al teach a process for treating ammonia containing waste water comprising contacting wastewater containing ammonia with a treating material wherein the material comprises a nonwoven carrier and attached to a support. Bacterial sludge comprising anammox bacteria. Note the abstract and page 35, col. 1, lines 1-25 and note figure 2 in col.2. Dissolved oxygen is not required so it can be present in low amounts, for example of not about 0.5 mg/l, see page 34, col. 1, lines 25-40. Ammonia is removed during the process.

Hiroyuki Tokitoh teaches acrylic fibers, note page 4, line 4.

Hatozaki, Ritsuko et al show a core structure of which also contains acryl fibers in a core structure. See Figure 1 at page 3.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to provide for the treatment in one step of the bacterial sludge as disclosed by Tal et al using a carrier and dissolved oxygen content as

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disclosed by Rouse et al, Tokitoh and Ritsuko et al, because the one step would have been more efficient for removing ammonia as nitrogen gas. The ammonia containing wastewater of Rouse et al discloses a dissolved oxygen at a concentration of not less than 0.5 mg/l and to further select polyacrylic fibers for the carrier and provision of the sludge in a core sheath structure as disclosed by Hiroyuki Tokitoh and Ritsuko et al, would have been prima facie obvious. To select for an amount of not less than 0.5 mg/l is clearly within the purview of an artisan and one of skill would have expected successful results. The nonwoven carrier would be expected to comprise filaments or fibers. The anammox bacteria are clearly disclosed. Also the active step of bringing the bacteria material and wastewater into contact with one another is clearly disclosed by Rouse et al. Further, Rouse et al do indeed require the use of a reaction tank and to provide dissolved oxygen through the tank is clearly an obvious modification of the cited prior art.

An air guide tube is also an obvious modification and well within the purview of an artisan. The carrier of Rouse et al is perpendicular to the reactor and appears to be a long carrier and acrylic fibers are clearly disclosed by Hiroyuki Tokitoh. Further, conditions of temperature and pH are clearly suggested if not taught by the cited prior art combination as well as BOD. Also since the material of Hiroyuki Tokitoh's carrier is the same as claimed the thickness would have been expected to be not less than 5mm and not less than 3 with respect to length to diameter ratio. Therefore, in the absence of persuasive evidence to the contrary the claims are rendered prima facie obvious over the cited prior art.

Response to Arguments

Applicant's arguments filed May 11, 2010 have been fully considered but they are not persuasive. In response to applicant's argument that that the arrangement of the bacteria sludge in Tal is different than what is claimed is noted, however, there is a newly added reference in the rejection with shows core sheath-like structure and the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The prior art clearly recognized that autotrophic anamox bacteria and bacteria including autorophic ammonia-oxidizing bacteria being used for a process for treating ammonia containing wastewater to remove ammonia as nitrogen gas. To provide and arrange the bacteria in a core sheath structure is well within the purview of an ordinary artisan. With the structure provided by the secondary prior art there would be no need to separate the ammonia-oxidizing bacteria and anamox bacteria because the structure would allow for the bacteria to continuously remove ammonia from the wastewater. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may

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be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, the selection of the core structures having fibers for attachment of the complex bacterial sludge providing a core-sheath structure is an obvious modification of the cited prior art. One of skill would have been motivated to streamline the process of Tal by selecting efficient carriers to simplify the process of Tal. The claims are rendered prima facie obvious.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

All claims fail to be patentably distinguishable over the state of the art discussed above and cited on the enclosed PTO-892 and/or PTO-1449. Therefore, the claims are properly rejected.

The remaining references listed on the previously enclosed PTO-892 and/or PTO-1449 are cited to further show the state of the art.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBBIE K. WARE whose telephone number is (571)272-0924. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah K. Ware/
Deborah K. Ware
Primary Examiner
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